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CIRCUIT BREAKER AND METHOD FOR PRODUCING SAME

~~Field of the Invention~~

[0001] The present invention relates to a circuit breaker having an interrupter chamber housing composed of plastic and an interrupter arranged in the interrupter chamber housing according to the features of the first part of Claim 1.

~~Related Art~~

[0002] A circuit breaker of this kind is known, for example, from European Patent Document EP 0 560 696 B1 which relates to a circuit breaker featuring a rotary double-break interrupter, the interrupter chamber housing being composed of two housing modules. The interrupter includes two stationary contact members which are each connected to corresponding connecting terminals via loop-shaped busbars, and a two-arm contact member which is rotatable about an axis and which interconnects the two stationary contacts in its closed position. For mounting the stationary contact members in the interrupter chamber housing in the known circuit breaker, these stationary contact members are inserted together with the busbars into corresponding receptacles of the interrupter chamber housing which are intended for this. In this known circuit breaker, it is disadvantageous, inter alia, that the heat generated during the normal use of the busbars is transferred to the interrupter chamber housing relatively slowly because the air surrounding the busbar is a very poor heat conductor. Besides, the busbars which are inserted into the receptacles of the interrupter chamber housing require an additional fixation to guarantee a sufficient strength in the region of the connecting terminals.

~~Summary of the Invention~~

[0003] The object of the present invention is to specify a circuit breaker of the type mentioned at the outset in which the heat generated by the busbars is readily dissipated into the interrupter chamber housing more rapidly than in known comparable circuit breakers. Moreover, the intention is to disclose a method for manufacturing a circuit breaker of that

kind.

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[0004] This objective is achieved with respect to the circuit breaker by the features of Claim 1 and with respect to the method for its manufacture by the features of Claim 6. Further, particularly advantageous refinements of the present invention are disclosed in the subclaims.

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[0005] The present invention is essentially based on the idea that, the conductors are not inserted in corresponding receptacles and fixated using additional means subsequent to the manufacture of the interrupter chamber housing as in the known circuit breakers but that they are brought into the outside walls of the interrupter chamber housing already during its manufacture and connected thereto over a large surface (that is virtually over the entire surface) in a positive locking and/or force-locking manner. Such a connection between the busbars and the outside walls of the interrupter chamber housing can be effected by manufacturing the respective interrupter chamber housing by injection molding, the busbars being inserted into the corresponding mold prior to injection molding.

[0006] In the case of loop-shaped busbars having blowout magnets arranged between the legs of the busbars (cf., for example, European Patent Document EP 0 560 696 B1 mentioned at the outset), the blowout magnets can also be fixated in the corresponding mold together with the busbars and subsequently molded into the side walls of the interrupter chamber housing during its manufacture. In this manner, both a stable fixation of the respective blowout magnet within the interrupter chamber housing and the required insulation of the respective blowout magnet against the corresponding busbar is achieved in a simple manner.

[0007] The circuit breaker according to the present invention not only has the advantage that a good heat transfer takes place from the heated busbars into the interrupter chamber housing surrounding them but also guarantees a high strength of the busbars in the region of the connecting terminals and in the region of the contacts which are subject to high dynamic loads.

Sub A [0008] A further advantage of the busbars which are injection-molded around consists in the mechanically highly firm fixation of the busbars in the housing, a later change of the positions of the contacts being ruled out.

Sub A ~~Brief Description of the Drawings~~

Sub A [0009] Further details and advantages of the present invention ensue from the following exemplary embodiment which will be explained with reference to Figure 1 which shows the longitudinal section through an interrupter chamber housing according to the present invention.

Sub A ~~Best Way of Implementing the Invention~~

[0010] In Fig. 1, reference numeral 1 denotes the interrupter chamber housing of a circuit breaker featuring a rotary double-break interrupter, the interrupter chamber housing being composed of two identical housing modules 2 and 3 made of plastic. Each of the two housing modules 2, 3 includes a stationary contact member 4, 5 which can be connected via a pivoting contact member which is not shown for reasons of clarity. Arranged between stationary contact members 4, 5 and connecting terminals 6, 7 provided outside of the interrupter chamber housing is in each case a loop-shaped busbar 8, 9, a blowout magnet 14, 15 being arranged between the two legs 10, 11 and 12, 13 of busbars 8, 9, respectively.

Sub A [0011] According to the present invention, both busbars 8, 9 and blowout magnets 14, 15 are arranged in outside walls 16, 17 of housing modules 2, 3 of interrupter chamber housing 1, and firmly connected to these outside walls over a large surface on the peripheral side so that a good heat transfer takes place from busbars 8, 9 to the plastic of outside walls 16, 17 which surrounds the busbars. In this context, a high heat transfer from busbars 8, 9 to outside walls 16, 17 of housing modules 2, 3 ensues, in particular, if the housing modules 2, 3 are manufactured by injection molding, and busbars 8, 9 and blowout magnets 14, 15 are brought into the corresponding molds for manufacturing housing modules 2, 3 as inserts prior to

injection molding.

[0012] The present invention is of course not limited to the above described exemplary embodiment. Thus, for example, the circuit breaker does not necessarily have to be one featuring a rotary double-break interrupter. Rather the interrupter can also be equipped with a single-arm pivoting contact member (single-break interrupter) or with a translatorily movable contact member.

[0013] Moreover, it is conceivable for the interrupter chamber housing to be manufactured, for example, by transfer molding or by casting of reaction resins in lieu of injection molding. In manufacturing methods of that kind, the busbars of the circuit breaker and, possibly, the blowout magnets are also brought into the corresponding mold for manufacturing the interrupter chamber housing or its modules prior to the transfer molding or casting process to ensure an "intimate" connection over a large surface between the busbars and the plastic surrounding them.

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